(e) The term "vessel" includes every description of watercraft or other artificial contrivance used or capable of being used as a means of transportation on water, including special purpose floating structures not primarily designed for or used as a means of transportation on water.

(f) The term "public vessel" means a vessel owned and operated by a government and not regularly employed in merchant service.

(g) For the purposes of §§ 1504.11, 1504.23, 1504.35, 1504.37, 1504.43(f)(2), and 1504.106, the term "barge" means an unpowered, flat bottom, shallow draft vessel including river barges, scows, carfloats, and lighters. For the purposes of these sections the term does not include ship shaped or deep draft barges.

(h) For purposes of §§ 1504.11 and 1504.23, the term "river towboat" means a shallow draft, low freeboard, self propelled vessel designed to tow river barges by pushing ahead. For purposes of these sections the term does not include other towing vessels.

(i) The term "longshoring operations" means the loading, unloading, moving, or handling of cargo, ship's stores, gear, etc., into, in, on, or out of any vessel on the navigable waters of the United States.

(j) The term "related employments" means any employments performed as an incident to or in conjunction with longshoring operations including, but not restricted to, securing cargo, rigging, and employment as a porter, checker, or watchman.

(k) The term "gangway" means any ramp-like or stair-like means of access provided to enable personnel to board or leave a vessel, including accommodation ladders, gangplanks and brows.

(l) The term "bulling" means the horizontal dragging of cargo across a surface with none of the weight of the cargo supported by the fall.

(m) For the purpose of § 1504.12 the term "ship's cargo handling gear" includes that gear which is a permanent part of the vessel's equipment and which is used for the handling of cargo other than bulk liquids, but does not include gear which is used only for handling or holding hoses, handling ship's stores or handling the gangway, or boom conveyor belt systems for the self-unloading of bulk cargo vessels.

(n) For purposes of the regulations in this part the terms "beam" or "strongback" mean a portable transverse or longitudinal beam which is placed across a hatchway and acts as a bearer to support the hatch covers.

(o) For the purposes of §§ 1504.23(b)(2) and 1504.106(b) the term "Mississippi River System" includes the Mississippi River from the head of navigation to its mouth, and navigable tributaries including the Illinois Waterway, Missouri River, Ohio River, Tennessee River, Allegheny River, Cumberland River, Green River, Kanawha River, Monongahela River, and such others to which barge operations extend.

(p) For the purpose of § 1504.106(b) the term "Gulf Intracoastal Waterway" means the system of that name extending from St. Marks, Florida to Brownsville and Harlingen, Texas, and including the Pearl River, Tombigbee River, Apalachicola River, Flint River, and such other navigable tributaries to which barge operations extend.

(q) The term "small trimming hatch" means a small hatch or opening, pierced in the tween deck or other intermediate deck of a vessel and intended for the trimming of dry bulk cargoes. It does not refer to the large hatchways through which cargo is normally handled.

§ 1504.4 Penalty.

As provided in Public Law 85–742, any employer who, willfully, violates or fails or refuses to comply with the provisions of the regulations of this part, and any employer or other person who willfully interferes with, hinders, or delays the Secretary or his authorized representative in carrying out his duties under subsection (c) of section 41 of the Act by refusing to admit the Secretary or his authorized representative to any place, or to permit the inspection or examination of any employment or place of employment, or who willfully hinders or delays the Secretary or his authorized representative in the performance of his duties in the enforcement of the regulations of this part, shall be guilty of an offense, and, upon conviction thereof, shall be punished for each offense by a fine of not less than $100 nor more than $3,000; and in any case where such employer is a corporation, the officer who willfully permits any such violation to occur shall be guilty of an offense, and, upon conviction thereof, shall be punished also for each offense by a fine of not less than $100 nor more than $3,000. The liability under this provision of Public Law 85–742 shall not affect any other liability of the employer under the Longshoremen's and Harbor Workers' Compensation Act.

§ 1504.5 Variation from the regulations of this part.

As provided in Public Law 85–742, in case of practical difficulties or unnecessary hardships, the Secretary in his discretion may grant variations from the regulations of this part or particular provisions thereof, and permit the use of other or different devices if he finds that the purpose of the regulation will be observed by the variation and the safety of employees will be equally secured thereby. Any person affected by such regulations or his agent, may request the Secretary to grant such variation, stating in writing the grounds on which his request is based. Any authorization by the Secretary of a variation shall be in writing, shall describe the conditions under which the variation shall be permitted, and shall be published as provided in section 3 of the Administrative Procedure Act (ch. 324, 60 Stat. 237), as amended. A properly indexed record of all variations shall be kept in the Office of the Secretary and be open to public inspection.

§ 1504.6 Reference specifications, standards, and codes.

Specifications, standards, and codes of agencies of the United States Government, to the extent specified in the text, form a part of the regulations of this part. In addition, under the authority vested in the Secretary under the Act, the specifications, standards, and codes of organizations which are not agencies of the United States Government, in effect on the date of the promulgation of the regulations of this part, as listed below, to the extent specified in the text, form a part of these regulations:

Convention Concerning the Protection Against Accidents to Workers Loading or Unloading Ships, International Labor Organization, Convention No. 32 (Revised, 1932). Subpart B, § 1504.12(a).

Underwriters' Laboratories, Incorporated, 207 East Ohio Street, Chicago, Illinois. Subpart G, § 1504.69(d) and Subpart I, § 1504.92(b)(3).

American Standard Safety Code for Head, Eye, and Respiratory Protection, Z2.1–1959. American Standards Association, Incorporated, 70 East 45th Street, New York 17, N.Y. Subpart J, §§ 1504.101(a), 1504.105(a).

§ 1504.7 Notification of accidents resulting in fatalities or serious injuries.

Within 48 hours after the occurrence of an accident causing the death of an employee or resulting in an employee's admission to a hospital as a bed patient, the employer shall file a copy of Bureau of Employees' Compensation Form US—202 (approved by Budget Bureau No. 44–R 887.2) with the Field Safety Consultant of the Bureau of Labor Standards serving the area where the accident occurred (in addition to such filing as is required by 20 CFR 31.3) unless prior thereto and as soon after the accident as feasible the employer has given oral or written notice of the accident to the person in charge of such office in sufficient detail to permit the accident to be identified readily.

§ 1504.8 Amendment of this part.

The Secretary may at any time upon his own motion or upon written petition of any interested person setting forth reasonable grounds therefor, and after opportunity has been given to interested persons to present their views, amend or revoke any of the provisions of this part.

Subpart B—Gangways and Gear Certification

§ 1504.11 Gangways.[1]

The employer shall not permit employees to board or leave any vessel, except a barge or river towboat, until the following requirements have been met:

(a) Whenever practicable, a gangway of not less than 20 inches walking surface, of adequate strength, maintained in safe repair and safely secured shall be used. If a gangway is not practicable, a substantial straight ladder, extending at least 36 inches above the upper landing surface, and adequately secured against shifting or slipping shall be pro-

[1] See also § 1504.21.

vided. When conditions are such that neither a gangway nor straight ladder can be used, a Jacob's ladder meeting the requirements of § 1504.22 may be used.

(b) Each side of such gangway, and the turntable, if used, shall have a railing with a minimum height of 33 inches measured perpendicularly from rail to walking surfaces at the stanchion, with a mid-rail. Rails shall be of wood, pipe, chain, wire or rope and shall be kept taut at all times. Portable stanchions supporting railings shall be so supported or secured as to prevent accidental dislodgment.

(c) Gangways on vessels inspected and certificated by the U.S. Coast Guard are deemed to meet the foregoing requirements, except in cases where the vessels' regular gangway is not being used.

§ 1504.12 Gear certification.[2]

(a) The employer shall not use the vessel's cargo handling gear until he has ascertained that the vessel has a current and valid cargo gear register and certificates which in form and content are in substantial accordance with the recommendations of the International Labor Office, as set forth in Appendix I of this part, and as provided by International Labor Organization Convention No. 32, and which indicates that the cargo gear has been tested, examined and heat treated by or under the supervision of persons or organizations defined as competent to make register entries and issue certificates pursuant to paragraphs (c) and (d) of this section.

(b) Public vessels and vessels holding a valid Certificate of Inspection issued by the U.S. Coast Guard are deemed to meet the requirements of paragraph (a) of this section.

(c) With respect to United States vessels not holding a valid Certificate of Inspection issued by the United States Coast Guard, persons or organizations competent to make entries in the registers and issue the certificates required by paragraph (a) of this section shall be only those persons currently accredited by the Bureau of Labor Standards, United States Department of Labor, as provided in Part 1505 of this chapter.

(d) With respect to vessels under foreign registry, persons or organizations competent to make entries in the registers and issue the certificates required by paragraph (a) of this section shall be: (1) those acceptable as such to any foreign nation, (2) those acceptable to the Commandant of the United States Coast Guard, or (3) those currently accredited by the Bureau of Labor Standards, United States Department of Labor, as provided in Part 1505 of this chapter.

Subpart C—Means of Access

§ 1504.21 Gangways and other means of access.

(a) The gangway shall be kept properly trimmed at all times.

(b) When a fixed tread accommodation ladder is used, and the angle is low enough to require employees to walk on the edge of the treads, cleated duckboards shall be laid over and secured to the ladder.

(c) When the lower end of a gangway overhangs the water between the ship and the dock in such a manner that there is danger of employees falling between the ship and the dock, a net or other suitable protection shall be rigged at the foot of the gangway in such a manner as to prevent employees from falling from the end of the gangway.

(d) If the foot of the gangway is more than one foot away from the edge of the apron, the space between them shall be bridged by a firm walkway equipped with railings with a minimum height of approximately 33 inches with mid-rails on both sides.

(e) Supporting bridles shall be kept clear so as to permit unobstructed passage for employees using the gangway.

(f) When the upper end of the means of access rests on or is flush with the top of the bulwark, substantial steps, properly secured and equipped with at least one substantial hand rail approximately 33 inches in height shall be provided between the top of the bulwark and the deck.

(g) Obstructions shall not be laid on or across the gangway.

(h) The means of access shall be adequately illuminated for its full length.

(i) Unless the construction of the vessel makes it impossible, the means of access shall be so located that drafts of cargo do not pass over it. In any event loads shall not be passed over the means of access while employees are on it.

§ 1504.22 Jacob's ladders.

(a) Jacob's ladders shall be of the double rung or flat tread type. They shall be well maintained and properly secured.

(b) A Jacob's ladder shall either hang without slack from its lashings or be pulled up entirely.

§ 1504.23 Access to barges and river towboats.

(a) Ramps for access of vehicles to or between barges shall be of adequate strength, provided with side boards, well maintained, and properly secured.

(b) Unless employees can step safely to or from the wharf, float, barge, or river towboat, either a ramp meeting the requirements of paragraph (a) of this section or a safe walkway meeting the requirements of § 1504.21(d) shall be provided. When a walkway is impracticable, a substantial straight ladder, extending at least 36 inches above the upper landing surface and adequately secured against shifting or slipping shall be provided. When conditions are such that neither a walkway nor a straight ladder can be used, a Jacob's ladder meeting the requirements of § 1504.22 may be used: *Provided, however,* That when these requirements cannot reasonably be met, by reason of local conditions, in respect to barges operating on the Mississippi River System, other safe means of access shall be provided.

(c) When a barge, raft or log boom is being worked alongside a larger vessel, a Jacob's ladder meeting the requirements of § 1504.22 shall be provided for each gang working alongside unless other safe means of access are provided.

(d) When longshoring operations are in progress on barges, the barges shall be securely made fast to the vessel, wharf, or dolphins.

§ 1504.24 Bridge plates and ramps.

(a) Bridge or car plates used afloat shall be of adequate strength, equipped with side boards along the space bridged, well maintained, and secured against movement.

(b) Ramps for access of vehicles to or between vessels shall be of adequate strength, provided with side boards, well maintained and properly secured.

§ 1504.25 Ladders.

(a) There shall be at least one safe and accessible ladder for each gang working in a hatch. However, no more than two such ladders are required in any hatch. An adequate means of gaining a handhold shall be provided at or near the head of each vertical fixed ladder in cases where any coaming or other structural features are such that they cannot serve this purpose.

(b) When any fixed ladder is visibly unsafe, the employer shall prohibit its use by employees.

(c) Straight ladders of adequate strength and suitably secured against shifting or slipping shall be provided as necessary when fixed hold ladders do not meet the requirements of paragraph (a) of this section, except that when conditions are such that a straight ladder cannot be used, Jacob's ladders meeting the requirements of § 1504.22 may be used.

(d) When four inches of clearance does not exist in back of ladder rungs, the ladder shall be deemed "unsafe" for the purpose of this section.

(e) When necessary to obtain access to or from a stowed deckload, ladders or steps of adequate strength, and secured against shifting or slipping, shall be provided: *Provided, however,* That adequate steps formed by the cargo itself will be acceptable when the nature of the cargo and the type of stowage permits. This paragraph does not apply to the circumstances covered by § 1504.54(f).

(f) Portable straight ladders used by employees for any purpose not otherwise specifically covered by this part shall be of adequate strength and lashed, blocked, or otherwise secured against shifting or slipping.

Subpart D—Working Surfaces

§ 1504.31 Hatch coverings.

(a) No cargo shall be loaded or unloaded by a fall or sling at any intermediate deck unless either the hatch at

[2] See also § 1504.51.

that deck is safely covered or a secure landing platform of a width not less than that of one section of hatch coverings has been placed across the hatch.

(b) Cargo shall not be landed on or handled over a covered hatch or tween deck unless all beams are in place under the hatch covers.

(c) Missing, broken, split, or poorly fitting hatch covers that would jeopardize the safety of employees shall be reported at once to the officers in charge of the vessel. Pending replacement or repairs by the vessel, work shall not be performed in the section containing the unsafe covers or in adjacent sections unless the flooring is made safe.

(d) When the hatch covers and beams are not of uniform size, they shall be placed only in the hatch, deck, and section in which they fit properly.

(e) Small trimming hatches located in intermediate decks shall be adequately covered or guarded while work is proceeding in the hatch in which they are located, unless they are actually in use.

§ 1504.32 Stowed cargo and temporary landing platforms.

(a) Temporary tables on which loads are to be landed shall be of sufficient size and strength to permit the employees thereon to work in safety.

(b) When an edge of a hatch section or of stowed cargo more than 8 feet high is so exposed that it presents a danger of persons falling, the edge shall be guarded by a line, safety net or railing.

(c) When two gangs are working in the same hatch on different levels, a safety net shall be rigged and securely fastened so as to prevent men or cargo from falling.

§ 1504.33 Deck loads.

(a) Employees shall not be permitted to pass fore and aft over or around deck loads unless there is a safe passage.

(b) Signalmen shall not be permitted to walk over deck loads from rail to coaming unless there is a safe passage.

§ 1504.34 Skeleton decks.

No cargo shall be worked on a skeleton deck, mechano deck or other superstructure unless temporary flooring is provided, when necessary, to make a safe working surface.

§ 1504.35 Open hatches.

Open weather deck hatches around which longshoremen must work which are not protected to a height of 24 inches by coamings, shall be guarded by taut lines at a height of 36 to 42 inches above the deck except on the side on which cargo is being worked. Any portable stanchions or uprights used shall be so supported or secured as to prevent accidental dislodgement; *Provided, however,* That the requirements of this section shall not be deemed to apply to barges or to Great Lakes type bulk carriers.

§ 1504.36 Weather deck rails.

Removable weather deck railings shall be kept in place except when cargo operations require them to be removed, in which case they shall be replaced as soon as such cargo operations are completed.

§ 1504.37 Sides of barges.

Employees shall not be permitted to walk along the sides of covered lighters or of barges with coamings more than 5 feet high unless there is a 3-foot clear walkway or a grab rail or taut handline is provided.

§ 1504.38 Freshly oiled decks.

If decks are wet with fresh paint or oil, the employer shall not permit employees to engage in longshoring operations until necessary walking and working areas have been made safe by the use of suitable non-skid materials.

Subpart E—Opening and Closing Hatches

§ 1504.41 Coaming clearances.

(a) *Weather deck.* If a deck load of lumber or other smooth sided deck cargo over 5 feet high is stowed within 3 feet of the hatch coaming and employees handling beams and hatch covers are not protected by at least a 24 inch height of the coaming, a taut handline shall be provided along the side of the deckload for their protection. The requirements of § 1504.35(a) are not intended to apply in this situation.

(b) *Intermediate deck.* (1) Before intermediate deck hatch covers and beams are removed or replaced by employees, there shall be a 3-foot working space between the stowed cargo and the coaming at both sides and at one end of the hatches with athwartship beams, and at both ends of those hatches with fore and aft beams, except that a reasonable tolerance will be permitted in circumstances where adherence to a 3-foot working space would create undue hardship.

(2) The 3-foot clearance required by subparagraph (1) of this paragraph is not required on the covered portion of a partially opened hatch, nor is it required when lower decks have been filled to beam height with cargo of such a nature as to provide a safe surface upon which employees may work.

(3) For purposes of subparagraph (1) of this paragraph, banana or other fitted gratings which are in good condition shall be considered a part of the decking when properly placed within the 3-foot area.

(c) *Trunk hatches and other permanent or semi-permanent structures and spare parts.* When bulkheads, lockers, reefer compartments or large spare parts are within 3 feet of the coaming, grab rails or taut handlines shall be provided for the protection of employees handling beams and hatch covers.

(d) The provisions of this section regarding coaming clearances do not apply to hatches which are opened by hydraulic or other mechanical means, but in all cases in which the 3 foot clearance does not exist, means shall be taken to prevent stowed cargo which is likely to shift from falling into the hold.

§ 1504.42 Beam and pontoon bridles.

Beam and pontoon bridles shall not be used unless they meet the following requirements:

(a) Bridles shall be long enough to easily reach the holes, rings, or other lifting attachments on the beams and pontoons. The bridles shall be of adequate strength and properly maintained, including covering or blunting of protruding ends in wire rope splices.

(b) Bridles for lifting hatch beams shall be equipped with toggles, shackles, or hooks or other devices of such design that they cannot become accidently dislodged from the beams with which they are used. Hooks other than those herein described may be used only when they are hooked into the standing part of the bridle. Toggles, when used, shall be at least one inch longer than twice the longest diameter of the holes into which they are placed.

(c) Bridles used for lifting pontoons and plugs shall have the number of legs required by the design of the pontoon or plug, and all legs shall be used. Where any use of a bridle requires fewer than the number of legs provided, idle legs shall be hung on the hook or ring, or otherwise prevented from swinging free.

(d) At least two legs of all strongback and pontoon bridles shall be equipped with a substantial fiber rope lanyard at least 8 feet long and in good condition. The bridle end of the lanyard may be of chain or wire.

§ 1504.43 Handling beams and covers.

Only paragraphs (f)(2), (h), and (i) of this section apply to folding, sliding, or hinged metal hatch covers or to those hatch covers handled by cranes carried for that purpose.

(a)(1) When hatch covers or pontoons are stowed on the weather deck abreast of hatches they shall be arranged in stable piles not closer than 3 feet from the hatch coaming and, when on the working side of the deck, not higher than the coaming, unless they are spread one high between coaming and rail with no space between them and with not less than a 24 inch height of hatch coaming maintained.

(2) When, in the case of pontoons, the requirements of subparagraph (1) of this paragraph cannot be met due to the narrowness of the available deck area, pontoons may be stowed more than one high against the coaming, provided that not less than a 24-inch height of hatch coaming is maintained on the working side of the vessel. If pontoons must be stowed closer than 3 feet to and higher than the coaming on the idle side, they shall be secured against movement.

(3) When some, but not all, conventional small weather deck hatch boards or similar covers on seagoing vessels are removed from the beams in a section of

a partially opened hatch during cargo handling, cleaning or other operations, those removed shall not be stowed on those left in place within that section.

(b) Beams shall be laid on their sides, or stood on edge close together and lashed: *Provided, however,* That this paragraph shall not apply in cases where beams are of such design that (1) the width of the flange is 50 percent or more of the height of the web and (2) that when a beam is stood upright the flange rests flat on the deck.

(c) Strongbacks, hatch covers and pontoons shall be so placed as not to interfere with a safe walkway from rail to hatch coaming or fore and aft, and so secured that they cannot be tipped over or dragged into hatches or overboard by drafts or gear. Dunnage or other suitable material shall be used under and between tiers of strongbacks and pontoons.

(d) Hatch covers unshipped in an intermediate deck shall be placed at least 3 feet from the coaming or they shall be removed to another deck. Strongbacks unshipped in an intermediate deck shall not be placed closer than 6 inches to the coaming, and if placed closer than 3 feet, they shall be so secured that they cannot be tipped or dragged into a lower compartment. If this is not possible they shall be removed to another deck.

(e) Any beam or pontoon left in place adjacent to a section through which cargo, dunnage, equipment, or any other material is being worked, shall be lashed, locked, or otherwise secured so that it cannot be displaced by accident. All portable, manually handled hatch covers, including those bound together to make a larger cover, shall be removed from any working section.

(f) The roller hatch beam at the edge of the open section of the hatch shall be lashed or pinned back so that it cannot be moved toward the open section.

(2) Rolling, sectional or telescopic hatch covers of barges which open in a fore and aft direction shall be secured against unintentional movement while in the open position.

(g) When a hatch is to be covered, hatch covers or night tents shall be used. Any partial hatch covering, such as alternate hatch covers or strips of dunnage, shall not be covered by a tarpaulin.

(h) Hinged or folding hatch covers normally stowed in an approximately vertical position shall be positively secured when in the upright position.

(i) Hatches shall not be opened or closed while employees are in the square of the hatch below.

Subpart F—Ship's Cargo Handling Gear

§ 1504.51 General requirements.[2]

(a) Neither the safe working load as specified in the cargo gear certification papers, nor any safe working load marked on the booms, shall be exceeded. Any limitations imposed by the certificating authority shall be adhered to.

(b) Any component of cargo handling gear, including tent gantlines and other associated rigging, which is visibly unsafe shall not be used until made safe.

§ 1504.52 Specific requirements.

Gear which does not comply with the following requirements shall not be used:

(a) *Preventers.* (1) When preventers are used they shall be of sufficient strength for the intended purpose and secured to the head of the boom independent of working guys except when, in the case of cast fittings, the strength of the fitting exceeds the total strength of all lines secured to it. Any tails, fittings, or other means of making the preventers fast on deck shall provide strength equal to that of the preventer itself.

(b) *Stoppers.* (1) When used, chain topping lift stoppers shall be in good condition, equipped with manila tails, and of a length to allow not fewer than three half-hitches in the chain.

(2) When used, chain stoppers shall be shackled or otherwise secured in such a manner that their links are not bent by being passed around fittings. The point of attachment shall be of sufficient strength and so located that the stoppers are reasonably in line with the normal topping lift lead at the time the stopper is applied.

(3) When used, patent stoppers of the clamp type shall be suited to the size of the rope used. Clamps shall be in good condition and free of paint and dirt which would prevent their being drawn tight.

(c) *Falls.* (1) The end of the winch fall shall be secured to the drum by clamps, U-bolts, shackles, or some other equally strong method. Fiber rope fastenings shall not be used.

(2) Winch falls shall not be used with fewer than three turns on the winch drum.

(3) Eyes in the ends of wire rope cargo falls shall not be formed by knots and, in single part falls, shall not be formed by wire rope clips.

(4) When the design of the winch permits, the fall shall be so wound on the drum that the control mechanism moves in the same direction as the load.

(d) *Heel blocks.* (1) When employees are required to work in the bight formed by the heel block, a preventer of at least ¾-inch diameter wire rope, rove reasonably snug and adequately secured, shall be rigged, or equally effective means shall be taken to hold the block and fall in the event that the heel block attachments should fail. Where physical limitations prohibit the fitting of a wire rope preventer of the required size or of other equally effective means, the maximum possible protection shall be provided.

(2) If the heel block is not so rigged as to prevent its falling when not under strain, it shall be secured to prevent alternate raising and dropping of the block: *Provided, however,* That this requirement shall not apply when the heel block is so located as to be at least 10 feet above the deck when at its lowest point.

(e) *Coaming rollers.* When used, portable coaming rollers, whether provided by the ship or by the employer, shall be secured by wire preventers in addition to the regular coaming clamps.

(f) *Cargo hooks.* Cargo hooks shall be as close to the junction of the falls as the assembly permits, but in no case farther than two feet from it, except that this provision shall not apply when the construction of the vessel and the operation in progress are such that fall angles in excess of 120 degrees do not normally occur. Overhaul chains shall not be shortened by bolting or knotting.

§ 1504.53 Cargo winches.

(a) *General.* (1) When moving parts of winches or other deck machinery present a hazard, they shall be guarded.

(2) Winches shall not be used if control levers operate with excessive friction or excessive play.

(3) Double gear winches or other winches equipped with a clutch shall not be used unless a positive means of locking the gear shift is provided.

(4) When changing gears on a two gear winch, there shall be no load other than the fall and cargo hook assembly on the winch.

(5) Any defect or malfunction of winches shall be reported immediately to the officer in charge of the vessel.

(6) Temporary seats and shelters for winch drivers which create a hazard to the winchmen or other employees shall not be used.

(7) Except for short handles on wheel type controls, winch drivers shall not be permitted to use winch control extension levers unless they are provided by either the ship or the employer. Such levers shall be of adequate strength and securely fastened with metal connections at the fulcrum and at the permanent control lever.

(b) *Steam winches.* (1) Means shall be taken to prevent escaping steam from obscuring any part of the decks or other work places or from otherwise hindering or injuring any employee.

(2) Access shall be maintained to the steam valve between each winch and the deck steam line. If this valve is not operative with normal hand pressure, the winch shall not be used.

(3) Extension control levers which tend to fall of their own weight shall be counterbalanced.

(4) When winches are left unattended, control levers shall be secured in the neutral position.

(c) *Electrical winches.* (1) When the electro-magnetic or other service brake is unable to hold the load, the winch shall not be used.

(2) Winches shall not be used when one or more control points, either hoisting or lowering, is not operating properly. Employees shall not be permitted to tamper with or adjust electric control circuits.

[2] See also § 1504.12.

(3) When winches are left unattended, control levers shall be placed in the neutral position and, whenever possible, the power shall be shut off or control levers locked at the winch or the operating controls.

§ 1504.54 Rigging gear.

(a) When alternate positions for securing guys are provided, the guys shall be so placed as to produce a minimum stress without permitting the boom to jackknife.

(b) The head of the midship boom shall be spotted no farther outboard of the coaming than is necessary for control of the load.

(c) *Preventers.* When preventers are used, the following shall apply:

(1) Preventers shall be properly secured to suitable fittings, other than those to which the guys are secured, and shall be as nearly parallel to the guys as available fittings permit.

(2) Unless the cleat is also a chock and the hauling part is led through the chock opening, the leads of preventers to cleats shall be such that the direction of the line pull of the preventer is as nearly as possible parallel to the plane of the surface on which the cleat is mounted.

(3) Guys and associated preventers shall be adjusted so as to share the load as nearly equally as practicable where cargo operations are being conducted by burtoning; *Provided, however,* That where guys are designed and intended for trimming purposes only and the preventer is intended to perform the function of the guy, the guy shall be left slack.

(d) Cargo falls under load shall not be permitted to chafe on any standing or other running rigging: *Provided, however,* That this shall not be construed to mean hatch coamings or other similar structural parts of the vessel.

(e) (1) Where a bull wire is taken to a gypsy head for the purpose of lowering or topping a boom, the bull wire shall be secured to the gypsy head by shackle or other equally strong method. Securing by fiber rope fastening will not be considered adequate.

(2) When, in lowering or topping a boom, it is not possible to secure the bull wire to the gypsy head, or when the topping lift itself is taken to the gypsy head, sufficient turns, in no case less than five (5), shall be used.

(f) When deck loads extend above the rail and there is less than 8 inches horizontal clearance between the edge of the deck load and the inside of the bulwark or rail, employees shall not be permitted to go overside unless adequate precautions are taken to prevent them from falling.

§ 1504.55 Cranes.

Unless permanently guarded, the accessible areas within the swing radius of the outermost part of the body of a revolving crane shall be temporarily guarded by ropes or other suitable means during cargo operations, so as to prevent an employee being in a position to be caught between the body of the crane and fixed parts of the vessel or of the crane itself.

Subpart G—Cargo Handling Gear and Equipment Other Than Ship's Gear

§ 1504.61 General.

(a) All gear and equipment provided by the employer shall be inspected by the employer or his authorized representative before each use and, when necessary, at intervals during its use, to ensure that it is safe. Any gear which is found upon such inspection to be visibly unsafe shall not be used until it is made safe.

(b) All special stevedoring gear provided by the employer, the strength of which depends upon components other than commonly used stock items such as shackles, ropes or chains, shall be tested as a unit in the following manner before initially being put into use:

(1) Gear intended to handle lifts up to and including 20 short tons (40,000 lbs.) shall be tested to 25 percent in excess of its safe working load.

(2) Gear intended to handle lifts over 20 short tons (40,000 lbs.) but not exceeding 50 short tons (100,000 lbs.) shall be tested to 5 short tons (10,000 lbs.) in excess of its safe working load.

(3) Gear intended to handle lifts over 50 short tons (100,000 lbs.) shall be tested to 10 percent in excess of its safe working load.

(4) The employer shall maintain a record of the dates and results of the tests with each unit of gear concerned clearly identifiable. The records shall be available for examination by representatives of the Bureau of Labor Standards.

(c) The safe working load of gear as specified in §§ 1504.62 through 1504.66 shall not be exceeded.

(d) The weight shall be plainly marked on any article of stevedoring gear hoisted by ship's gear and weighing in excess of 2,000 lbs.

§ 1504.62 Fiber rope and fiber rope slings.

(a) Table G-1 shall be used to determine the safe working load of various sizes of manila rope and rope slings at various angles, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products, provided that a safety factor of not less than five (5) is maintained.

(b) Where synthetic fiber ropes are substituted for manila ropes of less than three (3) inches circumference, the substitute shall be of equal size. Where synthetic fiber ropes are substituted for manila ropes of three (3) inches circumference or more, the size of the synthetic rope is to be determined from the formula:

$$C=\sqrt{0.6C_s^2+0.4C_m^2}.$$

Where C = the required circumference of the synthetic rope in inches.

C_s = the circumference to the nearest one-quarter inch of a synthetic rope having a breaking strength not less than the breaking strength of the size manila rope that would be required by paragraph (a) of this section.

C_m = the circumference of manila rope in inches which would be required by paragraph (a) of this section.

TABLE G-1
MANILA ROPE
(In pounds or tons of 2000 pounds)

Circumference	Diameter in Inches	Single Leg	60°	45°	30°
3/4	1/4	120 lbs.	204 lbs.	170 lbs.	120 lbs.
1	5/16	200	346	282	200
1-1/8	3/8	270	467	380	270
1-1/4	7/16	350	605	493	350
1-3/8	15/32	450	775	635	450
1-1/2	1/2	530	915	798	530
1-3/4	9/16	690	1190	973	690
2	5/8	880	1520	1240	880
2-1/4	3/4	1080	1870	1520	1080
2-1/2	13/16	1300	2250	1830	1300
2-3/4	7/8	1540	2660	2170	1540
3	1	1800	3120	2540	1800
3-1/4	1-1/16	1.0 Tons	1.7 Tons	1.4 Tons	1.0 Tons
3-1/2	1-1/8	1.2	2.1	1.7	1.2
3-3/4	1-1/4	1.35	2.3	1.9	1.35
4	1-5/16	1.5	2.6	2.1	1.5
4-1/2	1-1/2	1.8	3.1	2.5	1.8
5	1-5/8	2.25	3.9	3.2	2.25
5-1/2	1-3/4	2.6	4.5	3.7	2.6
6	2	3.1	5.4	4.4	3.1
6-1/2	2-1/8	3.6	6.2	5.1	3.6

In making such a substitution it should be ascertained that the inherent characteristics of the synthetic fiber are suitable for the intended service of the rope.

§ 1504.63 Wire rope and wire rope slings.

(a) Tables G–2 through G–5 shall be used to determine the safe working loads of various sizes and classifications of improved plow steel wire rope and wire rope slings with various types of terminals. For sizes, classifications and grades not included in these tables the safe working load recommended by the manufacturer for specific, identifiable products shall be followed, provided that a safety factor of not less than five (5) is maintained.

TABLE G–2

RATED CAPACITIES FOR IMPROVED PLOW STEEL, INDEPENDENT WIRE ROPE CORE, WIRE ROPE AND WIRE ROPE SLINGS

(In tons of 2000 pounds)

Rope Dia. Inches	SINGLE LEG					
	Vertical			Choker		
	A	B	C	A	B	C
6x19 CLASSIFICATION						
1/4"	.59	.56	.53	.44	.42	.40
3/8"	1.3	1.2	1.1	.98	.93	.86
1/2"	2.3	2.2	2.0	1.7	1.6	1.5
5/8"	3.6	3.4	3.0	2.7	2.5	2.2
3/4"	5.1	4.9	4.2	3.8	3.6	3.1
7/8"	6.9	6.6	5.5	5.2	4.9	4.1
1"	9.0	8.5	7.2	6.7	6.4	5.4
1-1/8"	11.	10.	9.0	8.5	7.8	6.8
6x37 CLASSIFICATION						
1-1/4"	13.	12.	10.	9.9	9.2	7.9
1-3/8"	16.	15.	13.	12.	11.	9.6
1-1/2"	19.	17.	15.	14.	13.	11.
1-3/4"	26.	24.	20.	19.	18.	15.
2"	33.	30.	26.	25.	23.	20.
2-1/4"	41.	38.	33.	31.	29.	25.

(A) - Socket or Swaged Terminal attachment.
(B) - Mechanical Sleeve attachment.
(C) - Hand Tucked Splice attachment.

TABLE G–3.

RATED CAPACITIES FOR IMPROVED PLOW STEEL, INDEPENDENT WIRE ROPE CORE, WIRE ROPE SLINGS

(In tons of 2000 pounds)

Rope Dia. Inches	TWO - LEG BRIDLE OR BASKET HITCH											
	Vertical			60°			45°			30°		
	A	B	C	A	B	C	A	B	C	A	B	C
6x19 CLASSIFICATION												
1/4"	1.2	1.1	1.0	1.0	.97	.92	.83	.79	.75	.59	.56	.53
3/8"	2.6	2.5	2.3	2.3	2.1	2.0	1.8	1.8	1.6	1.3	1.2	1.1
1/2"	4.6	4.4	3.9	4.0	3.8	3.4	3.2	3.1	2.8	2.3	2.2	2.0
5/8"	7.2	6.8	6.0	6.2	5.9	5.2	5.1	4.8	4.2	3.6	3.4	3.0
3/4"	10.	9.7	8.4	8.9	8.4	7.3	7.2	6.9	5.9	5.1	4.9	4.2
7/8"	14.	13.	11.	12.	11.	9.6	9.8	9.3	7.8	6.9	6.6	5.5
1"	18.	17.	14.	15.	15.	12.	13.	12.	10.	9.0	8.5	7.2
1-1/8"	23.	21.	18.	19.	18.	16.	16.	15.	13.	11.	10.	9.0
6x37 CLASSIFICATION												
1-1/4"	26.	24.	21.	23.	21.	18.	19.	17.	15.	13.	12.	10.
1-3/8"	32.	29.	25.	28.	25.	22.	22.	21.	18.	16.	15.	13.
1-1/2"	38.	35.	30.	33.	30.	26.	27.	25.	21.	19.	17.	15.
1-3/4"	51.	47.	41.	44.	41.	35.	36.	33.	29.	26.	24.	20.
2"	66.	61.	53.	57.	53.	46.	47.	43.	37.	33.	30.	26.
2-1/4"	83.	76.	66.	72.	66.	57.	58.	54.	47.	41.	38.	33.

(A) - Socket or Swaged Terminal Attachment.
(B) - Mechanical Sleeve Attachment.
(C) - Hand Tucked Splice Attachment.

TABLE G-4
RATED CAPACITIES FOR IMPROVED PLOW STEEL, FIBER CORE, WIRE ROPE AND WIRE ROPE SLINGS
(In tons of 2000 pounds)

Rope Dia. Inches	SINGLE LEG					
	Vertical			Choker		
	A	B	C	A	B	C
6x19 CLASSIFICATION						
1/4	.55	.51	.49	.41	.38	.37
3/8	1.2	1.1	1.1	.91	.85	.80
1/2	2.1	2.0	1.8	1.6	1.5	1.4
5/8	3.3	3.1	2.8	2.5	2.3	2.1
3/4	4.8	4.4	3.9	3.6	3.3	2.9
7/8	6.4	5.9	5.1	4.8	4.5	3.9
1	8.4	7.7	6.7	6.3	5.8	5.0
1-1/8	10.	9.5	8.4	7.9	7.1	6.3
6x37 CLASSIFICATION						
1-1/4	12.	11.	9.8	9.2	8.3	7.4
1-3/8	15.	13.	12.	11.	10.	8.9
1-1/2	17.	16.	14.	13.	12.	10.
1-3/4	24.	21.	19.	18.	16.	14.
2	31.	28.	25.	23.	21.	18.

(A) - Socket or Swaged Terminal attachment.
(B) - Mechanical Sleeve attachment.
(C) - Hand Tucked Splice attachment.

TABLE G-5
RATED CAPACITIES FOR IMPROVED PLOW STEEL, FIBER CORE, WIRE ROPE SLINGS
(In tons of 2000 pounds)

Rope Dia. Inches	TWO - LEG BRIDLE OR BASKET HITCH											
	Vertical			60°			45°			30°		
	A	B	C	A	B	C	A	B	C	A	B	C
6x19 CLASSIFICATION												
1/4	1.1	1.0	.99	.95	.88	.85	.77	.72	.70	.55	.51	.49
3/8	2.4	2.2	2.1	2.1	1.9	1.8	1.7	1.6	1.5	1.2	1.1	1.1
1/2	4.3	3.9	3.7	3.7	3.4	3.2	3.0	2.8	2.6	2.1	2.0	1.8
5/8	6.7	6.2	5.6	5.8	5.3	4.8	4.7	4.4	4.0	3.3	3.1	2.8
3/4	9.5	8.8	7.8	8.2	7.6	6.8	6.7	6.2	5.5	4.8	4.4	3.9
7/8	13.	12.	10.	11.	10.	8.9	9.1	8.4	7.3	6.4	5.9	5.1
1	17.	15.	13.	14.	13.	11.	12.	11.	9.4	8.4	7.7	6.7
1-1/8	21.	19.	17.	18.	16.	14.	15.	13.	12.	10.	9.5	8.4
6x37 CLASSIFICATION												
1-1/4	25.	22.	20.	21.	19.	17.	17.	16.	14.	12.	11.	9.8
1-3/8	30.	27.	24.	26.	23.	20.	21.	19.	17.	15.	13.	12.
1-1/2	35.	32.	28.	30.	27.	24.	25.	22.	20.	17.	16.	14.
1-3/4	48.	43.	38.	41.	37.	33.	34.	30.	27.	24.	21.	19.
2	62.	55.	49.	53.	48.	43.	43.	39.	35.	31.	28.	25.

(A) - Socket or Swaged Terminal attachment.
(B) - Mechanical Sleeve attachment.
(C) - Hand Tucked Splice attachment.

(b) Protruding ends of strands in splices on slings and bridles shall be covered or blunted.

(c) Where "U" bolt wire rope clips are used to form eyes, Table G–6 shall be used to determine the number and spacing of clips. The "U" bolt shall be applied so that the "U" section is in contact with the dead end of the rope.

(d) Wire rope shall not be secured by knots, except on haul back lines on scrapers.

TABLE G–6—NUMBER AND SPACING OF U-BOLT WIRE ROPE CLIPS

Improved plow steel, rope diameter inches	Number of clips		Minimum spacing (inches)
	Drop forged	Other material	
¼	3	4	3
⅜	3	4	3¾
½	4	5	4½
⅝	4	5	5¼
¾	4	6	6
⅞	5	6	6¾
1	5	7	7½
1⅛	6	7	8¼
1¼	6	8	9

§ 1504.64 Chains and chain slings.

(a) Tables G–7 and G–8 shall be used to determine the maximum safe working loads of various sizes of wrought iron and alloy steel chains and chain slings, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products. Proof coil steel chain, also known as common or hardware chain, or other chain not recommended for slinging or hoisting by the manufacturer, shall not be used for hoisting purposes.

(b) All sling chains, including end fastenings, shall be given a visual inspection before being used on the job. A thorough inspection of all chains in use shall be made every 3 months. Each chain shall bear an indication of the month in which it was thoroughly inspected. The thorough inspection shall include inspection for wear, defective welds, deformation and increase in length or stretch.

TABLE G–7
WROUGHT IRON CHAIN
(In pounds or tons of 2000 pounds)

Nominal Size Chain Stock Inch.	Single Leg	60°	45°	30°
* 1/4	1060	1835	1500	1060
* 5/16	1655	2865	2340	1655
3/8	2385	2.1	3370	2385
* 7/16	3250	2.8	2.3	3250
1/2	2.1	3.7	3.0	2.1
* 9/16	2.7	4.6	3.8	2.7
5/8	3.3	5.7	4.7	3.3
3/4	4.8	8.3	6.7	4.8
7/8	6.5	11.2	9.2	6.5
1	8.5	14.7	12.0	8.5
1-1/8	10.0	17.3	14.2	10.0
1-1/4	12.4	21.4	17.5	12.4
1-3/8	15.0	25.9	21.1	15.0
1-1/2	17.8	30.8	25.2	17.8
1-5/8	20.9	36.2	29.5	20.9
1-3/4	24.2	42.0	34.3	24.2
1-7/8	27.6	47.9	39.1	27.6
2	31.6	54.8	44.8	31.6

* These sizes of wrought iron chain are no longer manufactured in the United States.

TABLE G-8
ALLOY STEEL CHAIN
(In tons of 2000 pounds)

Nominal Size Chain Stock Inch.	Single Leg	60°	45°	30°
1/4	1.62	2.82	2.27	1.62
3/8	3.30	5.70	4.65	3.30
1/2	5.62	9.75	7.90	5.62
5/8	8.25	14.25	11.65	8.25
3/4	11.5	19.9	16.2	11.5
7/8	14.3	24.9	20.3	14.3
1	19.3	33.5	27.3	19.8
1-1/8	22.2	38.5	31.5	22.2
1-1/4	28.7	49.7	40.5	28.7
1-3/8	33.5	58.0	47.0	33.5
1-1/2	39.7	68.5	56.0	39.7
1-5/8	42.5	73.5	59.5	42.5
1-3/4	47.0	81.5	62.0	47.0

(c) Interlink wear, not accompanied by stretch in excess of five (5) percent, shall be noted and the chain removed from service when maximum allowable wear at any point of link, as indicated in Table G-9, has been reached.

TABLE G-9

MAXIMUM ALLOWABLE WEAR AT ANY POINT OF LINK

Chain size in inches	Maximum allowable wear in fraction of inches
1/4 (9/32)	3/64
5/16	1/16
3/8	1/16
7/16	3/64
1/2	1/32
5/8	1 1/64
3/4	3/64
7/8	1/32
1	1/16
1 1/8	3/32
1 1/4	1/8
1 3/8	3/32
1 1/2	1/16
1 3/4	1 1/32

(d) Chain slings shall be removed from service when, due to stretch, the increase in length of a measured section exceeds five (5) percent; when a link is bent, twisted or otherwise damaged; or when raised scarfs or defective welds appear.

(e) All repairs to chains shall be made under qualified supervision. Links or portions of the chain found to be defective, as described in paragraph (d) of this section, shall be replaced by links having proper dimensions and made of material similar to that of the chain. Before repaired chains are returned to service, they shall be proof tested to the proof test load recommended by the manufacturer.

(f) Wrought iron chains in constant use shall be annealed or normalized at intervals not exceeding six months when recommended by the manufacturer. The chain manufacturer shall be consulted for recommended procedures for annealing or normalizing. Alloy chains shall not be annealed.

(g) A load shall not be lifted with a chain having a kink or knot in it. A chain shall not be shortened by bolting, wiring or knotting.

§ 1504.65 Shackles.

(a) Table G-10 shall be used to determine the safe working loads of various sizes of shackles, except that higher safe working loads are permissible when recommended by the manufacturer for specific, identifiable products, provided that a safety factor of not less than five (5) is maintained.

TABLE G-10

SAFE WORKING LOADS FOR SHACKLES
[In tons of 2000 pounds]

Material size (inches)	Pin diameter (inches)	Safe working load
1/2	5/8	1.4
5/8	3/4	2.2
3/4	7/8	3.2
7/8	1	4.3
1	1 1/8	5.6
1 1/8	1 1/4	6.7
1 1/4	1 3/8	8.2
1 3/8	1 1/2	10.0
1 1/2	1 3/4	11.9
1 3/4	2	16.2
2	2 1/4	21.2

(b) Screw pin shackles provided by the employer and used aloft, except in cargo hook assemblies, shall have their pins moused.

§ 1504.66 Hooks other than hand hooks.

(a) The manufacturer's recommendations shall be followed in determining the safe working loads of the various sizes and types of specific and identifiable hooks. All hooks for which no applicable manufacturer's recommendations are available shall be tested to twice the intended safe working load before they are initially put into use. The employer shall maintain a record of the dates and results of such tests.

(b) Loads shall be applied to the throat of the hook since loading the point overstresses and bends or springs the hook.

(c) Hooks shall be inspected periodically to see that they have not been bent by overloading. Bent or sprung hooks shall not be used.

(d) Teeth of case hooks shall be kept in good condition.

(e) Jaws of patent clamp type plate hooks shall be kept in safe condition so that they will grip plates securely.

§ 1504.67 Pallets.

(a) Pallets shall be of such material and construction and so maintained as to safely support and carry loads being handled on them. Fastenings of reusable pallets shall be bolts and nuts, drive screws (helically threaded nails), annular threaded nails or fastenings of equivalent strength.

(b) Wing or lip type pallets hoisted by means of bar bridles shall have an overhanging wing or lip at least 3 inches long.

(c) Loaded pallets which on visual examination do not meet the requirements of this section, shall be placed on pallets meeting the requirements before being hoisted into or out of the vessel.

(d) Bridles used to handle flush end or box type pallets shall be of such a design as to prevent them from becoming disengaged from the pallet under load.

§ 1504.68 Chutes, gravity conveyors and rollers.

(a) Chutes used in the manual handling of cargo shall be of adequate length and strength for the use to which they are put and shall be kept free of splinters and sharp edges.

(b) Chutes shall be equipped with sideboards of sufficient height to prevent cargo from falling off.

(c) Chutes and gravity roller sections shall be firmly placed or secured to prevent displacement.

(d) Gravity rollers shall be of sufficient strength for the weight of material which is placed upon them. Rollers shall be locked in position to prevent them from falling or jumping out of the frame.

(e) Frames shall be kept free of burrs and sharp edges.

(f) When necessary for safe operation, provision shall be made for braking objects at the delivery end of the roller or chute.

§ 1504.69 Powered conveyors.

(a) Readily accessible stop controls shall be provided for use in an emergency.

(b) Electric motors and controls on grain trimmers shall be of the explosion-proof type approved by the Underwriters' Laboratories, Incorporated, for use in hazardous locations, Class II, Group G.

(c) All conveyor and trimmer drives which create a hazard shall be adequately guarded.

(d) Each grain trimmer shall have a control box located on the weather deck in close proximity to the spout feeding the trimmer.

(e) Power cables between the deck control box and the grain trimmer shall be used only in continuous lengths without splice or tap between connections.

§ 1504.70 Portable stowing winches.

(a) Portable stowing winches shall be used only with the knowledge and consent of the officer in charge of the vessel.

(b) Portable stowing winches used in connection with operations shall at all times be properly secured to prevent shifting.

(c) When internal combustion powered stowing winches are located below the weather deck or in other enclosed spaces, the exhaust shall be led topside to open air and away from the hatch opening.

§ 1504.71 Rain tents.

When using rain tents, lanyards shall be secured to padeyes or other fixed structures of the vessel which are strong enough or to objects which are heavy enough to withstand the breaking stress of all lanyards attached.

§ 1504.72 Tools.

(a) *General.* Employers shall not issue or permit the use of visibly unsafe tools.

(b) *Portable electric tools.* (1) Portable electric tools which are held in the hand shall be equipped with switches of a type which must be manually held in a closed position.

(2) All portable, power-driven circular saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to the covering position.

§ 1504.73 Mechanically-powered vehicles used aboard vessels.

(a) All automotive equipment shall be maintained in good working order and safety devices shall not be removed or made inoperative, except as otherwise provided.

(b) Overhead guards for fork lift trucks:

(1) Fork lift trucks shall be equipped with operator's overhead guards of such design and construction as to protect the operator from boxes, cartons, packages, bagged material or other similar individual items of cargo which may fall from the load being handled or from stowage.

(2) The guard shall be of such construction that it does not interfere with good visibility, but openings in the top of the guard must not exceed six inches in one of the two dimensions, width or length. Larger openings may be permitted provided no opening is larger than the smallest unit of cargo that is likely to fall on the guard.

(3) The guard shall be large enough to extend over the operator in all normal circumstances of truck operation, including forward tilt.

(4) In fork lift trucks equipped with a single tilt cylinder, provision shall be made so that failure of this cylinder or associated parts will not cause the overhead guard to injure the operator.

(5) The overhead guard may be removed only at times when the construction of the truck is such that the presence of such a guard would prevent the truck from entering working spaces, and if the operator cannot be injured by low overhead obstructions.

(c) Guards for bulk cargo-moving vehicles:

(1) Every crawler type, rider operated, bulk cargo-moving vehicle shall be equipped with an operator's guard of such design and construction as to protect the operator, when seated, against injury from contact with a projecting overhead.

(2) Guards and their attachment points shall be so designed as to be able to withstand, without excessive deflection, a load applied horizontally at the operator's shoulder level equal to the drawbar pull of the machine.

(3) Guards shall not be required when the vehicle is used in situations in which the possibility of the seated operator coming in contact with projecting overheads does not exist.

(d) End platform guards:

(1) Every truck operated from an end platform or pedal position shall be equipped with an operator's platform guard of such design that it permits rapid and unobstructed egress.

(2) Guards shall be so designed as to be able to withstand, without excessive deflection, a load equal to the weight of the loaded machine.

(e) Forks, fork extensions or other attachments shall be suitably secured to prevent unintentional disengagement.

(f) Weights and loads:

(1) The vehicle weight, with and without removable counterweights, shall be clearly posted on all mechanically-powered vehicles which are lifted aboard vessels.

(2) The rated capacity of every fork lift truck, with and without removable counterweights, shall be posted on the vehicle in such a manner as to be readily visible to the operator.

(3) Loads in excess of the rated capacity shall not be lifted or carried by lift trucks.

(4) If loads are lifted by two or more trucks working in unison, the total weight shall not exceed the combined safe lifting capacity of all the trucks.

(g) (1) Steering knobs, when furnished on vehicles where the driver is not in a sitting position, shall be of a mushroom type unless the steering mechanism is of a type that prevents road reactions from causing the steering handwheel to spin. The steering knob shall be mounted within the periphery of the wheel.

(2) Steering knobs or similar ancillary devices shall not be used on the steering wheels of trucks in which the driver is in a sitting position.

(h) No load on a fork lift truck or industrial crane truck shall be suspended or swung over any employee.

(i) When mechanically-powered vehicles are used, adequate provisions shall be made to ensure that the working surface can support the vehicle and load, and that hatch covers, truck plates, or other temporary surfaces cannot be dislodged by movement of the vehicle.

(j) When mechanically-powered vehicles are left unattended, the controls shall be neutralized, power shut off, brakes set, and the forks, blade, or scoop shall be placed in the lowered position.

(k) When lift trucks or other mechanically powered vehicles are being operated on open deck type barges, the edges of the barges shall be suitably guarded by railings, sideboards, timbers or other means sufficient to prevent vehicles from rolling overboard. When operated on covered lighters where door openings other than those being used are left open, adequate means shall be taken as necessary to prevent vehicles from rolling overboard through such openings.

§ 1504.74 Mobile crawler or truck cranes temporarily placed aboard vessels for longshoring operations.

(a) Mobile crawler or truck cranes used by the employer shall meet the following requirements:

(1) The crane weight shall be posted on all cranes which are hoisted aboard vessels.

(2) The maximum manufacturer's rated safe working loads for the various working radii of the boom and the maximum and minimum radii at which the boom may be safely used with and without outriggers shall be conspicuously posted near the controls and shall be visible to the operator. A radius indicator shall be provided.

(b) The posted safe working loads of mobile crawler or truck cranes under the conditions of use shall not be exceeded.

(c) Accessible areas within the swing radius of the outermost part of the body of a revolving crane shall be temporarily guarded by ropes or other suitable means during cargo operations, so as to prevent an employee being in a position to

be caught between the body of the crane and fixed parts of the vessel or of the crane itself.

§ 1504.75 Notifying ship's officers before using certain equipment.

(a) The employer shall notify the officer in charge of the vessel before bringing aboard ship internal combustion or electric powered tools, equipment or vehicles.

(b) The employer shall also notify the officer in charge of the vessel before using the ship's electric power for the operation of any of his electric tools or equipment.

§ 1504.76 Grounding.

(a) Any portable equipment or tools powered by electric motors and used by employees, shall be grounded either through a third wire in the cable containing the circuit conductors or through a separate wire which is grounded at the source of the current.

(b) Grounding circuits, other than by means of the structure of the vessel on which the equipment is being used, shall be checked to ensure that the circuit between the ground and the grounded power conductor has resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

Subpart H—Handling Cargo [4]

§ 1504.81 Slinging.

(a) Drafts shall be safely slung before being hoisted. Loose dunnage or debris hanging or protruding from loads shall be removed.

(b) Cargo handling bridles, such as pallet bridles, which are to remain attached to the hoisting gear while hoisting successive drafts, shall be attached by shackles, or other positive means shall be taken to prevent them from becoming accidentally disengaged from the cargo hook.

(c) Drafts of lumber, pipe, dunnage and other pieces, the top layer of which is not bound by the sling, shall be slung in such a manner as to prevent sliders. Double slings shall be used on unstrapped dunnage, except when, due to the size of hatch or deep tank openings, it is impractical to use them.

(d) Case hooks shall not be used for handling cases into or out of the vessel, unless the cases are specifically designed to be handled by this means.

(e) Bales of cotton, wool, cork, wood pulp, gunny bags or other similar articles shall not be hoisted into or out of the vessel by their straps unless the straps are of sufficient strength to support the weight of the bale and two hooks, each in a separate strap, are used.

(f) Loads requiring continuous manual guidance while in motion shall be provided with tag lines.

§ 1504.82 Building drafts.

(a) Drafts shall be so built or such means shall be taken as to prevent cargo from falling from the draft.

(b) Hand loaded buckets or tubs used in handling bulk cargo shall not be loaded above their rims.

§ 1504.83 Stowed cargo, tiering and breaking down.

(a) When necessary, cargo shall be secured or blocked to prevent its shifting or falling.

(b) In breaking down, precautions shall be taken, when necessary, to prevent the remaining cargo from falling.

(c) Employees trimming bulk cargo shall be checked in and out by the foreman. Before securing any reefer compartment, a check shall be made to ensure that no employee remains inside. Frequent checks shall be made to ensure the safety of any employee working alone in a tank or cargo compartment.

§ 1504.84 Bulling cargo.

(a) Bulling cargo shall be done with the bull line led directly from the heel block, except that bulling may be done from the head of the boom when the nature of the cargo and the surface over which it is dragged are such as to avoid stalling the load, or when the winch actually does not have sufficient strength, with the purchase used, to overload the boom.

(b) Snatch blocks shall be used to provide a fair lead for the bull line so as to avoid unnecessary dragging of the bull line against coamings and obstructions.

(c) Falls led from cargo booms of vessels shall not be used to move scows, lighters or railroad cars.

(d) Snatch blocks shall not be used with the point of the hook resting on the flange of a beam, but shall be hung from padeyes, straps or beam clamps. Snatch blocks or straps shall not be made fast to batten cleats or other insecure fittings.

(e) Beam or frame clamps shall be so secured to the beam as to minimize the possibility of their slipping, falling or being pulled from the beam.

§ 1504.85 Containerized cargo.

(a) The gross maximum allowable weight shall be permanently marked on every van and reusable cargo container. The gross maximum allowable weight shall be considered the weight of the van or container at the time of hoisting by the vessel's gear, except when the actual gross weight is plainly marked or otherwise indicated on the van or container or when the van or container is empty.

(b) The provisions of paragraph (a) of this section are not intended to require vans or containers to be weighed to ascertain the actual gross weight when other means of obtaining this information is available.

(c) Actual gross weight markings or indications shall be identified on the van or container by date, voyage number, or other suitable means. Those referring to prior shipments shall be removed or obliterated to avoid confusion.

(d) For the purpose of this section, the terms "van" or "container" mean only completely enclosed reusable units intended to carry more than one smaller unit, or which may be used to carry bulk commodities. They do not mean cylinders, drums, crates, cases, cartons, packages, sacks, unitized loads, or any other of the usual forms of packaging.

Subpart I—General Working Conditions

§ 1504.91 Housekeeping.

(a) Weather deck walking and working areas shall be kept reasonably clear of lines, bridles, dunnage and all other loose tripping or stumbling hazards.

(b) Gear or equipment, when not in use, shall be removed from the immediate work areas, or shall be so placed as not to present a hazard.

(c) Slippery conditions shall be eliminated as they occur.

(d) Loose paper, dunnage and debris shall be collected as the work progresses and be kept clear of the immediate work area.

(e) Dunnage shall not be placed on deck where it interferes with the free movement of the drafts.

(f) Dunnage racked against sweat battens shall not be used when the levels of such racks are above the safe reach of employees.

(g) Dunnage, hatch beams, tarpaulins or gear not in use shall be stowed no closer than 3 feet to the port and starboard sides of the weather deck hatch coaming, except that a reasonable tolerance shall be permitted where strict adherence is rendered impracticable due to the circumstances.

(h) *Nails.* (1) Nails which are protruding from shoring or fencing in the immediate work areas shall be bent over or otherwise rendered harmless.

(2) Dunnage, lumber, or shoring material in which there are visibly protruding nails shall be removed from the immediate work area, or, if left in that area, the nails shall be bent over or otherwise rendered harmless.

(i) Employees shall not be exposed to ice which may fall from aloft under conditions where the accumulation of such ice and the circumstances at the time are such as to constitute a hazard.

§ 1504.92 Illumination.

(a) All walking and working areas shall be adequately illuminated.

(b) Portable lights shall meet the following requirements:

(1) Portable lights shall be equipped with substantial reflectors and guards to prevent flammable and other material from coming in contact with the bulb, except that guards are not required where the construction of the reflector is such that the bulb is deeply recessed.

(2) Portable lights shall be equipped with heavy duty electric cords and may be suspended by such cords only when the means of attachment of the cord to

[4] 46 CFR Parts 146–147 contains regulations of the U.S. Coast Guard pertaining to the handling of explosives and other dangerous cargo.

the light is such as to prevent the light from being suspended by the electrical connections. All connections and insulation shall be maintained in safe condition.

(3) Lighting wires and fixtures for portable lights shall be so arranged as to be free from contact with drafts, running gear, or other moving equipment.

(4) Portable lights shall be so arranged that they do not shine in the eyes of winchdrivers or hatchtenders.

(5) Portable cargo lights furnished by the employer for use aboard vessels and purchased after September 1, 1966, shall be listed as approved by the U.S. Coast Guard or shall bear the Underwriters Laboratories, Incorporated, Marine Label.

(c) Employees shall not be permitted to enter dark holds, compartments, decks or other places without a flashlight or other suitable portable light. The use of matches or open flame lights is prohibited.

§ 1504.93 Ventilation and atmospheric conditions.

(a) Ventilation requirements with respect to carbon monoxide:

(1) When internal combustion engines exhaust into the hold or intermediate deck, the employer shall see that tests of the carbon monoxide content of the atmosphere are made as frequently as conditions require to ensure that dangerous concentrations do not develop. Employees shall be removed from the compartment involved when the carbon monoxide concentration exceeds 100 parts per million (.01%). When neither natural ventilation nor the vessel's ventilating system is adequate to keep the carbon monoxide concentration below this allowable limit, the employer shall use blowers sufficient in size and number and so arranged as to accomplish this before work is resumed.

(2) A record of the date, time, location and results of the tests required by subparagraph (1) of this paragraph shall be maintained for at least 30 days after the work is completed. The record shall be available for examination by representatives of the Bureau of Labor Standards.

(3) The intakes of portable blowers and any exposed belt drives shall be adequately guarded by screens.

(4) The frames of portable blowers shall be grounded at the source of the current either through a third wire in the cable containing the circuit conductors or through a separate wire. When the vessel is the source of the current the ground shall be made to the structure of the vessel.

(5) The employer shall not permit the use of shore electrical circuits unless they have been checked to ensure that the circuit between the ground and the grounded power conductor has resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current. When the vessel is the source of the current, it is required only that a check be made to ensure good electrical contact between the ground wire and the vessel's structure.

(b) (1) Before commencing to load grain which has been fumigated, the employer shall ascertain from the elevator operator that the cargo is free from hazardous concentrations of fumigants.

(2) Before commencing to load cargo other than grain, which has been fumigated at the loading port, the employer shall ascertain that said cargo is free from hazardous concentrations of fumigants.

(c) Before employees are permitted to enter or work in stowage spaces or tanks in which explosive, poisonous, noxious or gaseous cargoes have been carried or are stowed, or in which dry ice has been used as a refrigerant, or which have been fumigated, or in which there is a possibility of oxygen deficiency, the employer shall ascertain from the officer in charge of the vessel the conditions of the work place with respect to atmospheric contaminants.

(d) When it is ascertained from the officer in charge of the vessel that the atmosphere in which employees would be working is immediately dangerous to life, or if the atmosphere becomes immediately dangerous to life during cargo handling operations, no employee shall be permitted to enter or remain in the work place until the atmospheric condition has been made safe. Atmospheres immediately dangerous to life are those which contain less than 16.5 percent oxygen, or which by reason of the high toxicity of the contaminant, as in fumigation, or the high concentration of contaminants, as with carbon dioxide, would endanger the life of a person breathing them for even a short period of time.

(e) When it is ascertained from the officer in charge of the vessel that the atmosphere in which employees would be working contains gaseous contaminants not immediately dangerous to life, or if the atmosphere becomes so contaminated during cargo handling operations, no employee shall be permitted to enter or remain in the work place until the atmosphere is made safe, or the employees are protected by suitable respiratory protective equipment in accordance with the requirements of § 1504.102 (a) and (b). Gaseous contaminants not immediately dangerous to life are gases present in concentrations that could be breathed for a short period without endangering the life of a person breathing them, but which might produce discomfort and possible injury after a prolonged single exposure or repeated short exposures.

(f) When employees are exposed to heavy concentrations of dusts, as in loading bulk grain, they shall be protected by suitable respiratory protective equipment in accordance with the requirements of § 1504.102 (a) and (c).

§ 1504.94 Sanitation and drinking water.

(a) Longshoring operations shall not be carried on in the immediate vicinity of uncovered garbage or in the way of overboard discharges from sanitary lines unprotected by a baffle or splash boards.

(b) Clean drinking water in clean, covered containers shall be provided. Individual sanitary drinking cups or some other equally sanitary device shall be conveniently available.

§ 1504.95 Longshoring operations in the vicinity of repair and maintenance work.

(a) Longshoring operations shall not be carried on when chipping or scaling of decks, bulkheads or sides of vessels creates excessive noise which interferes with communication of warnings or instructions.

(b) Longshoring operations shall not be carried on in the hold or on deck beneath men working in the rigging overhead when such overhead work creates a hazard of falling objects.

(c) Longshoring operations shall not be carried on where employees are exposed to injurious light rays, hot metal, or sparks, any of which result from welding or cutting.

(d) Longshoring operations shall not be carried on where employees are exposed to unsafe concentrations of dust or vapors from sand blasting or spray painting.

§ 1504.96 First aid and life saving equipment.

(a) Unless a first aid room and a qualified attendant are close at hand and prepared to render first aid to employees on behalf of the employer, the employer shall furnish a first aid kit for each vessel on which work is being performed, except that when work is being performed on more than one small vessel at one pier only one kit is required. The kit shall be kept close to the vessel, and at least one employee close at hand shall be qualified to administer first aid.

(b) The first aid kit shall consist of a weatherproof container with individual sealed packages for each type of item. The contents of such kit shall include a sufficient quantity of at least the following types of items:

Gauze roller bandages, 1 inch and 2 inch.
Gauze compress bandages, 4 inch.
Adhesive bandages, 1 inch.
Triangular bandage, 40 inch.
Ammonia inhalants and ampules.
Antiseptic applicators or swabs.
Burn dressing.
Eye dressing.
Wire or thin board splints.
Forceps and tourniquet.

(c) The contents of the first aid kit shall be checked before being sent out on each job to ensure that all expended items have been replaced.

(d) There shall be available for each vessel being worked one Stokes basket stretcher, or its equivalent, permanently equipped with bridles for attaching to the hoisting gear, except that there need be no more than two stretchers on each

pier. Stretchers shall be kept close to the vessels. This regulation does not apply where the ambulance services carry such stretchers.

(e) The employer shall ensure that there is in the vicinity of each vessel being worked at least one U.S. Coast Guard approved 30-inch lifering with not less than 90 feet of line attached and at least one portable or permanent ladder which will reach from the top of the apron to the surface of the water. If the above equipment is not available at the pier, the employer shall furnish it during the time that he is working the vessel. When working a barge, scow, raft, lighter, log boom, or carfloat alongside a ship, a U.S. Coast Guard approved 30-inch lifering, with not less than 90 feet of line, shall be provided either on the floating unit itself or aboard the ship in the immediate vicinity of each floating unit being worked.

(f) When employees are working on log booms or cribs, lifelines shall be furnished and hung overside to the water's edge.

§ 1504.97 Qualifications of machinery operators.

(a) Only those employees who understand the signs, notices, and operating instructions and are familiar with the signal code in use shall be permitted to operate a crane, winch or other power-operated hoisting apparatus, or any power-operated vehicle.

(b) No employee known to have defective uncorrected eyesight or hearing, or to be suffering from heart disease, epilepsy, or similar ailments which may suddenly incapacitate him shall be permitted to operate a crane, winch or other power-operated hoisting apparatus or a power-operated vehicle.

(c) No minor under 18-years of age shall be employed in occupations involving the operation of any power-operated hoisting apparatus or assisting in such operations by performing work such as hooking on or landing drafts, rigging gear, etc.

§ 1504.98 Grain fitting.

(a) Where employees are engaged in work on longitudinal bulkheads or shifting boards (other than longitudinal bulkheads of feeders) at a distance of eight (8) feet or more above any ceiling, tank top or deck, the following shall apply:

(1) If working off portable straight ladders the provisions of § 1504.25(f) of this Part shall apply;

(2) If working off staging, any lumber used in the construction thereof shall be sound, straight grained, free from cross grain, shakes, and large, loose or dead knots. It shall also be free from dry rot, large checks, worm holes or other defects which impair its strength. Platform planking used as a work surface shall not be less than 2 x 10 lumber and the width of the platform shall not be less than 18 inches.

(3) If working from other elevated positions, employees shall be protected from falling by safety belt and lifeline or other equivalent protection.

(b)(1) When grain fitting operations are in progress in the square of an intermediate deck, the hatch covering at that deck shall be such as to cover the hatch except for the minimum open spaces necessary to perform the work.

(2) When coverings used to provide a temporary work surface are other than the vessels' hatch covers placed in their normal positions, they shall be of adequate strength and so placed or secured that they cannot be accidentally dislodged.

(c) When the erection of grain fittings requires employees to work on surfaces immediately adjacent to or between open deep tanks, either the deep tank covers shall be put in place, the opening covered by a net, or the opening guarded by a line, railing or net rigged as a railing, or by other suitable means.

(d) When removing hatch coverings from the interiors of feeders at the completion of their construction, or when removing or replacing hatch coverings in the interiors of feeders for any purpose at other times, employees engaged in this work shall be protected from falling by the use of adequate individual lifelines, properly tended, or by nets or other means suitable for the purpose. Except for the minimum open spaces necessary, hatch coverings shall not be removed within feeders under construction until such construction is completed.

(e) When repair or other work is carried out in the interior of an existing feeder and circumstances do not allow the covering of the hatch at that deck, employees shall be protected from falling by the use of adequate individual lifelines, properly secured and if necessary tended, or by nets or other means suitable for the purpose.

(f) Such other sections of this Part as are applicable to grain fitting operations shall be adhered to.

Subpart J—Personal Protective Equipment

§ 1504.101 Eye protection.

(a) When, because of the nature of the cargo being handled, an eye hazard from flying particles or heavy dust exists, employees shall be protected by eye protection equipment meeting the specifications prescribed by the American Standard Safety Code for Head, Eye and Respiratory Protection, Z-2.1.

(b) Eye protection equipment shall be maintained in good condition.

(c) Eye protection equipment which has previously been used shall be cleaned and disinfected before it is issued by the employer to another employee.

(d) Employees who wear corrective spectacles while engaged in eye hazardous work shall be protected by eye protection equipment of a type which can be worn over personal spectacles, except that glasses with prescription ground safety lenses may be worn in lieu of cover goggles when such glasses provide suitable protection against the hazard involved.

§ 1504.102 Respiratory protection.

(a) *General.* (1) Except as provided in subparagraph (c)(3) of this section, respiratory protective equipment required by this Part shall carry U.S. Bureau of Mines approval for the use intended. In cases where the U.S. Bureau of Mines does not issue approval against the particular hazard, equipment shall be acceptable to the Bureau of Labor Standards. Respiratory protective equipment shall be used only for the purpose intended and no modification of the equipment shall be made.

(2) Respiratory protective equipment shall be inspected regularly and maintained in good condition. Gas mask canisters and chemical cartridges shall be replaced as necessary so as to provide complete protection. Mechanical filters shall be cleaned or replaced as necessary so as to avoid undue resistance to breathing.

(3) Respiratory protective equipment which has been previously used shall be cleaned and disinfected before it is issued by the employer to another employee.

(4) Employees required to use respiratory protective equipment shall be instructed in its use.

(b) *Protection against gaseous contaminants not immediately dangerous to life.* (1) In concentrations of ammonia of less than 3 percent, or of other gases less than 2 percent, by volume, a canister type gas mask equipped with the proper type of canister shall be used. Different canisters are approved for use against the following gases and groups of gases: acid gases, hydrocyanic acid gas, chlorine gas, organic vapors, ammonia gas, carbon monoxide or combinations of the above.

(2) In low concentrations (less than 0.1 percent by volume, but above the Threshold Limit Value of the gas), a chemical cartridge respirator equipped with the type of cartridge approved for use against the particular gases or groups of gases listed in subparagraph (1) of this paragraph shall be used.

(c) *Protection against dusts.* (1) For protection against pneumoconiosis producing dusts, a respirator equipped with the type of filter approved for such purpose shall be used.

(2) For protection against toxic dusts, a respirator equipped with the type of filter approved for such purpose shall be used.

(3) For protection against nuisance dusts, a respirator equipped with the type of filter required in subparagraph (1) of this paragraph or a suitable dust mask shall be used.

§ 1504.103 Protective clothing.

(a) When employees are handling cargo which, due to ruptured, leaking or inadequate containers, may cause burns, skin irritation or be otherwise injurious to health, they shall be protected by suitable protective clothing.

(b) Protective clothing which has been previously worn shall be cleaned

and disinfected before it is issued by the employer to another employee.

§ 1504.104 Foot protection.

The employer shall arrange through means, such as vendors or local stores, or otherwise, to make safety shoes readily available to all employees, and shall encourage their use.

§ 1504.105 Head protection.

(a) When employees are handling cargoes of loose scrap metal, bulk ores which contain ore in a chunky form, or bulk commodities of a similar nature, they shall be protected by protective hats meeting the specifications contained in the American Standard Safety Code for Head, Eye, and Respiratory Protection, Z–2.1.

(b) Protective hats which have been previously worn shall be cleaned and disinfected before they are issued by the employer to another employee.

§ 1504.106 Protection against drowning.

(a) Employees working on log booms shall be protected by U.S. Coast Guard approved buoyant vests or U.S. Coast Guard approved work vests.

(b) Except when engaged in loading or discharging ocean going vessels, employees walking or working on the decks of barges on the Mississippi River System and the Gulf Intracoastal Waterway shall be protected by U.S. Coast Guard approved buoyant vests or U.S. Coast Guard approved work vests.

(c) Buoyant vests and work vests shall be maintained in good condition and shall be considered unserviceable when damaged so as to affect their buoyant properties or capability of being properly fastened.

Appendix I

CARGO GEAR REGISTER AND CERTIFICATES

The cargo gear register, designated Form I by the ILO, is a booklet containing instructions and forms on which the following information is recorded:

Part I. Annual Inspection and Quadrennial Thorough Examination of Derricks and Permanent Attachments (including Bridle Chains) to the Derricks, Masts and Decks.

Part II. Annual Thorough Examination of Cranes, Winches, Hoists, and Accessory gear other than Derricks and Permanent Attachments Thereto.

Part III. Annual Thorough Examination of Gear which is Exempt from Heat Treatment.

Part IV. Heat Treatment of Chains, Rings, Hooks, Shackles and Swivels which Require such Treatment.

The following are the sample forms of certificates recommended by the ILO.

Test Certificate No. ------ Form No. 2

CERTIFICATE OF TEST AND EXAMINATION OF WINCHES, DERRICKS AND THEIR ACCESSORY GEAR, BEFORE BEING TAKEN INTO USE

(Form prescribed by ----------)

Name of ship on which machinery is fitted ----------

(1) Situation and description of machinery and gear, with distinguishing number or mark (if any)	(2) Angle to the horizontal of derrick boom while the load was applied (degrees)	(3) Proof load applied (tons)	(4) Safe working load at the angle shown in column 2 (tons)

(5) Name and address of public service, association, company or firm making the test and examination ----------

(6) Position of signatory in public service, association, company, or firm ----------

I certify that on the ------ day of ----------, 19--, the above machinery, together with its accessory gear, was tested by a competent person in the manner set forth on the reverse side of this certificate; that a careful examination of the said machinery and gear by a competent person after the test showed that it had withstood the proof load without injury or permanent deformation; and that the safe working load of the said machinery and gear is as shown in column 4.

(Date) ---------- (Signature) ----------

NOTE: "Competent person" means a person acceptable as such to the competent authority in the country of issue of the certificate.

[Reverse of Form 2]

INSTRUCTIONS

Every winch with the whole of the gear accessory thereto (including derricks, goosenecks, eye plates, eye bolts, or other attachments) shall be tested with a proof load which shall exceed the safe working load as follows:

Safe working load	*Proof load*
Up to 20 tons	25 percent in excess.
20–50 tons	5 tons in excess.
Over 50 tons	10 percent in excess.

The proof load shall be lifted with the ship's normal tackle with the derrick at an angle which should not be more than 15 degrees to the horizontal, or, when this is impracticable, at the lowest practicable angle. The angle at which the test was made should be stated in the certificate of test. After the proof load has been lifted, it should be swung as far as possible in both directions.

As a general rule, all tests should be carried out in this way by dead load, and no exception should be allowed in the case of gear on new ships. In the case of replacements or renewals, however, spring or hydraulic balances may be used where dead loads are not available. Where a spring or hydraulic balance is used it shall be accurate, and the test should not be regarded as satisfactory unless the indicator remains constant for a period of at least five minutes.

After being tested as aforesaid, all lifting machinery, with the whole of the gear accessory thereto shall be examined to see whether any part has been injured or permanently deformed by the test.

The safe working load shown in column 4 is applicable only to a swinging derrick. When using fixed derricks, such as "union purchase" rigs, the safe working load should as a general rule be reduced; in any case, it should be determined with due regard to the actual conditions of use.

In the case of heavy derricks, care should be taken that the appropriate shrouds and stays are rigged.

NOTE: The expression "ton" means a ton of 1,000 kg or 2,200 lb.

Test Certificate No. ------ Form No. 3

CERTIFICATE OF TEST AND EXAMINATION OF CRANES OR HOISTS, AND THEIR ACCESSORY GEAR BEFORE BEING TAKEN INTO USE

(Form prescribed by ----------)

Name of ship on which machinery is fitted ----------

(1) Situation and description of crane or hoist, with distinguishing number or mark (if any)	(2) For jib cranes radius at which the proof load was applied	(3) Proof load applied (tons)	(4) Safe working load (for jib cranes at radius shown in column 2) (tons)

(5) Name and address of public service, association, company or firm making the test and examination ----------

(6) Position of signatory in public service, association, company or firm ----------

I certify that on the ------ day of ---------- 19--, the above machinery, together with its accessory gear, was tested by a competent person in the manner set forth on the reverse side of this certificate; that a careful examination of the said machinery and gear by a competent person after the test showed that it had withstood the proof load without injury or permanent deformation; and that the safe working load of the said machinery and gear is as shown in column 4.

(Signature) ----------

Date ----------

NOTE: "Competent person" means a person acceptable as such to the competent authority in the country of issue of the certificate.

[Reverse of Form 3]

INSTRUCTIONS

Every crane and other hoisting machine, with its accessory gear, shall be tested with a proof load which shall exceed the safe working load as follows:

Safe working load	*Proof load*
Up to 20 tons	25 percent in excess.
20–50 tons	5 tons in excess.
Over 50 tons	10 percent in excess.

The proof load shall be lifted and swung as far as possible in both directions. If the jib of the crane has a variable radius, it should be tested with a proof load, as defined above, at the maximum and minimum radii of the jib. With hydraulic cranes where, owing to the limitation of pressure, it is impossible to lift a load 25 percent in excess of the safe working load, it will be sufficient to lift the greatest possible load.

After being tested, each crane or hoist, with the whole of the gear accessory thereto, shall be examined to see whether any part has been injured or permanently deformed by the test.

NOTE: The expression "ton" means a ton of 1,000 kg or 2,200 lb.

Form No. 4

Test Certificate No. ------

CERTIFICATE OF TEST AND EXAMINATION OF CHAINS, RINGS, HOOKS, SHACKLES, SWIVELS AND PULLEY BLOCKS

(Form prescribed by ----------)

(1) Distinguishing number or mark (if any)	(2) Description of gear*	(3) Number tested	(4) Date of test	(5) Proof load applied (tons)	(6) Safe working load (tons)

*The dimensions of the gear, the type of material of which it is made and, where applicable, the heat treatment received in manufacture should be stated (unless Form No. 6 is used for the purpose).

(7) Name and address of makers or suppliers ----------

(8) Name and address of public service, association, company or firm making the test and examination ----------

(9) Position of signatory in public service, association, company or firm ----------

I certify that on the ------ day of ---------- 19--, the above gear was tested and examined by a competent person in the manner set forth on the reverse side of this certificate; that the examination showed that the said gear withstood the proof load without injury or deformation; and that the safe working load of the said gear is as shown in Column 6.

(Signature) ----------

(Date) ----------

NOTE: "Competent person" means a person acceptable as such to the competent authority in the country of issue of the certificate.

[Reverse of Form 4]

INSTRUCTIONS

Chains, rings, shackles and other loose gear (whether accessory to a machine or not) shall be tested with a proof load equal to that shown against the article in the following table:

Article of gear	*Proof load*
Chain, ring, hook, shackle or swivel ----------	100 percent in excess of the safe working load.
Pulley blocks:	
Single-sheave block ----------	300 percent in excess of the safe working load.
Multiple-sheave block with safe working load up to and including 20 tons.	100 percent in excess of the safe working load.
Multiple-sheave block with safe working load over 20 tons up to and including 40 tons.	20 tons in excess of the safe working load.
Multiple-sheave block with safe working load over 40 tons.	50 percent in excess of the safe working load.
Pitched chains used with hand-operated pulley blocks and rings, hooks, shackles or swivels permanently attached thereto.	50 percent in excess of the safe working load.
Hand-operated pulley blocks used with pitched chains and rings, hooks, shackles or swivels permanently attached thereto.	50 percent in excess of the safe working load.

After being tested, all the gear shall be examined, the sheaves and the pins of the pulley blocks being removed for the purpose, to see whether any part has been damaged or permanently deformed by the test.

NOTE: The expression "ton" means a ton of 1,000 Kg or 2,200 lb.

Test Certificate No. _____

Form No. 5

CERTIFICATE OF EXAMINATION AND TEST OF WIRE ROPE BEFORE BEING TAKEN INTO USE

(Form prescribed by _____)

Name and address of maker or supplier of rope _____

Circumference/diameter* of rope _____

Number of strands _____

Number of wires per strand _____

Lay _____

Quality of wire _____

Date of test of sample of rope _____

Load at which sample broke _____

Safe working load, subject to any stated qualifying conditions such as minimum pulley diameter, direct tensile load, etc _____

Name and address of public service, association, company or firm making the examination and test _____

Position of signatory in public service, association, company or firm making the examination and test _____

I certify that the above particulars are correct, and that the examination and test were carried out by a competent person.

(Date) _____ (Signature) _____

NOTE: "Competent person" means a person acceptable as such to the competent authority in the country of issue of the certificate.

* Delete what does not apply.

INSTRUCTIONS [Reverse of Form No. 5]

Wire rope shall be tested by sample, a piece being tested to destruction, and the safe working load of running ropes shall not exceed one-fifth of the breaking load of the sample tested.

Certificate No. _____

Form No. 6

CERTIFICATE OF HEAT TREATMENT OF CHAINS, RINGS, HOOKS, SHACKLES AND SWIVELS WHICH REQUIRE SUCH TREATMENT

(Form prescribed by _____)

(1) Distinguishing number or mark	(2) Description of gear*	(3) Number of certificate of test and examination	(4) Number heat treated	(5) Date of heat treatment	(6) Nature of heat treatment given	(7) Defects found at inspection after heat treatment

* The dimensions of the gear, the type of material of which it is made, and the heat treatment received in manufacture should be stated.

(8) Name and address of public service, association, company or firm carrying out the heat treatment and inspection _____

(9) Position of signatory in public service, association, company or firm _____

I certify that on the date shown in Column 5, the gear referred to in Columns 1 to 4 was heat-treated (indicated in Column 6) under my supervision; that after being so heat-treated every article was carefully inspected, and that no defects affecting its safe working condition were found other than those indicated in Column 7.

(Date) _____ (Signature) _____

NOTES: "Competent person" means a person acceptable as such to the competent authority in the country of issue of the certificate.

For requirements as to heat treatment, see reverse side.

[Reverse of Form No. 6]

INSTRUCTIONS

ANNEALING

Chains (other than bridle chains attached to derricks or masts), rings, hooks, shackles and swivels made of wrought iron, used in hoisting or lowering, shall be annealed at the following intervals:

	If used on lifting machinery driven by power	If used solely on lifting machinery worked by hand
Half-inch (12.5 mm) and smaller chains, rings, hooks, shackles and swivels in general use.	6 months.....	12 months.
All other chains, rings, hooks, shackles and swivels in general use.....	12 months.....	2 years.

OTHER HEAT TREATMENT

Chains, rings, hooks, shackles and swivels made of material other than wrought iron shall be heat treated in accordance with procedures approved by the competent authority.

Certificate No. ------ Form No. 7

CERTIFICATE OF ANNUAL THOROUGH EXAMINATION OF GEAR WHICH DOES NOT REQUIRE TO BE PERIODICALLY HEAT TREATED

(Form prescribed by ----------)

(1) Distinguishing number or mark	(2) Description of gear*	(3) Number of certificate of test and examination	(4) Remarks

*The dimensions of the gear, the type of material of which it is made, and the heat treatment received in manufacture should be stated.

(5) Name and address of public service, association, company or firm making the test and examination ----------

---

(6) Position of signatory in public service, association, company or firm ----------

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I certify that on the ------ day of ---------- 19--, the above gear was thoroughly examined by a competent person, and that no defects affecting its safe working condition were found other than those indicated in Column 4.

(Signature) ----------

(Date) ----------

NOTES: This certificate is optional. The above particulars may be entered in Part III of the Register (Form No. 1).

"Competent person" means a person acceptable as such to the competent authority in the country of issue of the certificate.

For list of gear not required to be heat-treated and definition of "thorough examination", see reverse side.

INSTRUCTIONS

Gear not required to be heat treated, but required to be thoroughly examined by a competent person once at least in every twelve months:

Plate-link chains.
Pitched chains.
Rings, hooks, shackles and swivels permanently attached to pitched chains, pulley blocks or weighing machines.
Hooks and swivels having ball bearings or other case-hardened parts.
Bordeaux connections.

Other gear exempted by the competent authority, as follows:

NOTE: "Thorough examination" means a visual examination, supplemented if necessary by other means such as a hammer test, carried out as carefully as conditions permit in order to arrive at a reliable conclusion as to the safety of the parts examined; if necessary for the purpose, parts of the machines or gear must be dismantled.

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